REPORT ON THE

CAWNPORE EXPERIMENTAL STATION

FOR THE RABI SEASON OF 1886-87.

ALLAHABAD:

NORTH-WESTERN PROVINCES AND OUDH GOVERNMENT PRESS.

1888.

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DEPARTMENT OF LAND RECORDS AND AGRICULTURE, N.-W. P. AND OUDH.

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Dated Cawnpore, the 29th November, 1887.

From

LIEUT.-COLONEL D. G. PITCHER,

Offg. Dir., Dept. of Land Records and Agri.,

N.-W. Provinces and Oudh,

To

The CHIEF SECRETARY to GOVERNMENT,

N.-W. Provinces and Oudh.

Sir,

I have the honor to submit for information the report on the Cawnpore Experimental Station for the rabi season of 1886-87, written by Mir Muhammad Husain, Assistant Director, who conducted the work of Superintendent. In paragraph 1 of the letter covering the report for last year, it was suggested that the report should no longer issue as a separate compilation, but be incorporated with the annual report of this department. It has, however, been finally decided—*vide* Government of India's Circular No. $\frac{52G}{69\text{-}6}$, dated 14th September, 1887, paragraph 6—that the report is to be published as heretofore, and I therefore now so submit it.

2. There is little of novelty to call for comment. Experiments with manures, organic and inorganic, with green soiling, deep ploughing, and irrigation were continued with but little variation on the old lines, the results of which are elaborately tabulated. Varying with the season, as the latter may be wet or dry, some manures show better in one season than others. It would only be after a long and continuous series, much longer than are yet available, that authoritative deductions could be drawn as to the precise gain or loss resulting from any particular treatment. For the past season the general outturn was very disappointing at least one-third less than we had reason to expect. The adverse causes were heavy hail, at seed time, and, most severe frost, at the time of flowering. On the other hand the crops were free to an unusual extent from fungoid growths.

Experiments were made with English wheat seed sent out through the India office, The condition of the seed on arrival was bad, but still there was enough with which to show what we have shown before, *viz.*, that we have better varieties or rather perhaps local varieties that suit us well, and have even a European reputation. Local varieties were as usual subjected to comparative trial, and one now introduced for the first

time on the station and known as Baxar appears likely to compete successfully with the best of our own Provincial varieties. Of all experimental work on the station there is none of greater value than that touching the selection of seed and trial of varieties.

Ensilage continues to be managed with success. One grass silo kept for the purpose was opened after three years; rain had evidently penetrated and the contents were useless, but it was hardly to be expected that with grass the result would be otherwise, as it is the material most difficult of all to manage. Úsar grass from one of the úsar reserves gave good silage after being stored for the ordinary time.

The sale of implements appears on the whole to have been less brisk than formerly, exceptions being small English grain-crushers and chaff-cutters, for which there is increasing demand.

I have the honor to be,

SIR,

Your most obedient servant,

D. G. PITCHER, LT.-COLONEL,

Offg. Director.

REPORT

ON THE

CAWNPORE EXPERIMENTAL STATION,

FOR THE RABI SEASON OF 1886-87.

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1. *Character of the season.*—As reported before at the time of sowing, just when the seed was sown, a heavy hailstorm had done great damage, and in the month of February, just at the time when the fields were in full blossom, the abnormally bitter frost ruined the success and the prosperity of the crops. Though it did not do much harm to the farm crops, yet the yield got reduced considerably. The field which promised to have 10 maunds hardly gave two-thirds of it.

2. Except the damage done by the hailstorm and the frost, no diseases affected any variety of the wheat sown.

Classification of the experiments.—The experiments are—

(A) Permanent. (B) Temporary.

The appended statements, Nos. 1 to 9, will show the results of the permanent, and the statements Nos. 10 to 12, results of temporary experiments.

Of the A series the result may be summed up thus—

(I.) *Whether wheat can be grown year after year by the aid of artificial manure.*—The plots under this experiment are termed standard and duplicate, being 26 in number; in the 13 plots wheat is sown year after year, and their duplicate plots are alternated with wheat and maize.

The treatment of these plots is the same as reported last year. The different fertilizers, the effect of which is being determined, are shown in statements Nos. 1 and 2. This year saltpetre alone, and combined with other manures, has not shown any superiority over poudrette, cow and sheep dung, put in the standard plots. The largest yield is obtained from the plot manured with poudrette. The ashes of dung have again proved to be of no good. Against the unmanured plots in the series all the manured ones, except the one with the ashes of cowdung, have given greater yield. Poudrette this time stands first. Saltpetre and bonedust second; sheep dung and gypsum third.

Economically, there is no gain against the cost of any of the plots in the series.

This may be attributed to a certain extent to the effect of the frost, but greatly to the fact that by keeping land under one kind of crop for years without rotation, some ingredients in the soil, essential for plant food, are exhausted; therefore the fertility of the soil is decreased.

This fact almost in all cases has been proved by the duplicate series, which is treated in all respects just the same as the foregoing one, except being sown alternately with wheat and maize.

Statement No. II contains the result of the duplicate series. It shows that the yield in all the plots is larger than their counterparts in the standard series, ashes of cowdung have again failed here. This proves that nitrogen is the most essential thing for wheat.

The economical result of the effect of the fertilizers in question, together with the rotation, is not bad. In five out of 13 cases it has left a profit of from 2 to 15 rupees per acre.

Poudrette here also has given the largest yield, leaving a net profit of Rs. 15 per acre. Last year the case was not so. Sheepdung is next; ashes of cowdung, with saltpetre, have come out third, and cowdung with bonedust and sheepdung with gypsum last.

In the duplicate series the increase in yield of some of the plots against the unmanured ones is very great.

Cow and sheepdung, with saltpetre, saltpetre with bonedust and superphosphate, have given larger percentage on straw.

(II.) *Green soiling.*—The statement No. III, herewith appended, shows the result. It indicates that in this year hemp and indigo water, as well as indigo stubble, have not done any good. The reason may be considered that by applying this fertilizer for years, which is no doubt very weak in action, the land has lost a good deal of its natural fertility.

Indigo crop ploughed in and gypsum added have given the largest yield.

Fresh indigo refuse with lime and hemp with gypsum have done good.

Economically, the indigo and hemp crops taken off, and the stubble ploughed in as manure, are most profitable—a net profit of Rs. 22 and 3-14 are left in the two cases.

Last year, out of the 13 kinds of the green soiling, eight had left a profit of from 1 to 16 rupees.

(III.) *Miscellaneous manure.*—The statement No. V contains the result.

This is to ascertain how far some of the things, which are a mere waste, and in some cases one does not know how to get rid of them, have any manurial value.

Eight plots are under this experiment which have not received any strong manure for years. In this case, of course, the vitality of the soil cannot be kept up.

However, the result is that giving anything in the shape of manure is better than no manure at all.

This year road scrapings have given a larger yield than even ammonial chloride.

Economically, the losses are very great. This shows that for good husbandry the farmyard manure is the essential thing.

(IV.) *Watering.*—The statement No. VI contains the result of the experiment, which no doubt depends entirely on the season.

This year by five waterings the largest outturn was obtained, and the decrease is proportionate to the number of waterings.

(V) *Canal against well-watering.*—The statement No. VI shows, that the well has given the usual result; that is, its effect is better than canal water. Though the cost of well-watering is Rs. 5-13-0 against Rs 2-10-0, yet the loss by the canal water is double, being Rs. 14-9-0 per acre against Rs. 7-6-0.

(VI.) *Hemp and indigo as green manure.*—To confirm the effect of indigo and hemp used as manure, the experiment is tried on a large scale. In four different plots hemp is ploughed in, and in five indigo, some with and some without lime.

The statements Nos. VII and VIII contain the average of the outturn of all the plots treated similarly. They show that the plot manured with hemp has given more than double grain against the unmanured plot and has left a profit of Rs. 4. Indigo with lime shows better result than indigo by itself.

(VII.)—*Ploughing experiments.*—Statement No. IX will show the result of deep and shallow ploughing. As these plots have not received manure for years, the outturn per acre is very poor. From next season manure will be applied to them.

B.—Temporary experiments.—Of the temporary experiments the result of the following has been recorded:—

1(*a*).—The effect of cake-feddung against the cake applied as manure;

(*b*).—The effect of undecorticated cotton seed.

The statements Nos. X and XI contain the result of the experiments. They show that the effect of both the cake-feddung and the cake is about the same, but the use of dung is more economical.

The result of cotton seed experiment has not shown any success. The yield in either case has not been so good as with mustard cake and its dung.

The experiment is for five years, and this is the second year.

II.—*To determine for how long the residue of a fertilizer remains available for a plant.*—This experiment will continue for five years. This is the second year.

I.—Mundiya against Muzaffarnagar wheat.—The statement No. XIII will show the result of the trial. The experiment will continue for five years. This is the first year.

The present result is considerably against the Muzaffarnagar wheat, which has given an outturn of only 592lbs. per acre against 1,209lbs; but the former plot had suffered much by the hailstorm, hence the result is not much to be relied upon.

Miscellaneous.—Sowing a catch crop of lucerne on oats was tried in last year, but this neither gave a good crop of oats nor of grass. However, the result is yet to be seen.

II.—Buxar wheat experiment.—Buxar wheat seed was received, when most of the fields had been occupied. No comparative trial of a scientific accuracy, which could only be made by sowing it in a big field alongside the Muzaffarnagar or the ordinary variety of the district, was then possible. The seed was distributed among three cultivators, Mirai Káchhi, Locan Lodh, and Badlu Chamar, to be sown in such small plots of their holdings as did not happen to be sown at the time, the object of cultivation being to ascertain—

(*a*) its susceptibility to disease,
(*b*) time of maturity,
(*c*) suitability to the climate of this district,
(*d*) general yield.

Of the three plots in which it was sown only two were manured, one of which had, however, borne a crop of maize in the preceding kharif.

The average outturn of the three plots amounted to 16·3 maunds per acre, which, considering the unfavourable character of the season, cannot by any means be said to below. The outturn of the several plots and their treatment are noted in the following table:—

Serial number.	Area of plots.	*Past history.*			*Treatment in 1886.*					Outturn per acre.
		1884.	1885.		Crop in preceding kharif.	Manure.	Ploughing.	Weeding.	Watering.	
			Manure.	Crop.						
	Square yards.									Maunds.
1	900	Old fallow.	*Nil* ...	Fallow ...	*Nil* ...	Woolen refuse.	6	*Nil* ...	4	21·5
2	1,350	Do. ...	„ ...	Juár ...	„ ...	*Nil* ...	8	„ ...	3	14·3
3	844	Do. ...	„ ...	Fallow ...	Maize ...	Cowdung,	6	„ ...	3	14 0

The plants were of vigorous growth and the crop was exceptionally free from rust and other fungoid diseases; the only injury which it suffered from was frost. The grain came to maturity at least 10 days earlier than the Muzaffarnagar variety. This is not a small thing in its favour at a place where hot winds set in early and prove a ruin to the late varieties.

III.—English wheat experiment.—The following are the results of the experimental cultivation of wheat presented by Messrs. E. G. Oakshott and Co., Reading. The seed was sown at three stations, *viz.*, Experimental Station, Cawnpore, Lyall Farm, Ujhaoli, Budaun, and again on Babú Luchman Pershad's farm adjoining the Cawnpore Experimental Station. At the first two places it failed entirely, the results of that sown in the vicinity of the Experimental Station are noted below.

The seed was sown in four highly cultivated plots especially prepared for wheat. It was seriously damaged in transit, as informed in this Office No. 6017, dated 22nd November, 1886, and was therefore sown very thick, the quantity used being more than four times of what would have been required for an equal area had the seed been sound. The germination was very irregular. The grain did not ripen till the end of April, and two of the plots, which were at a distance from the canal distributary, and could not be watered more than three times, did not yield a single grain. The other two plots, each of which was watered six times, yielded the following quantities :—

Number of plot.	Area of plots in square yards.	Actual outturn in lbs.	Outturn per acre lbs.
1	250	60	1,161
2	300	76	1,226

Ensilage.—1. A rainy season grass silo, filled in three years ago, was opened, and the contents found unfit for use. It was scarcely expected that the result would be otherwise with grass after such a lapse of time.

2. From the 4th to 10th September, 100 maunds of grass, taken from one of the úsar plots, was ensilaged in an ordinary pit. The cost of filling and cutting was Rs. 6-4-0. On the 20th of June the pit was opened, the upper layer weighing about 10 maunds had gone bad, but the rest was very good, and was consumed by the cattle.

Sale of Implements.—The following statement will show the difference in the sale of implements made in the workshop and imported from other countries :—

Month and date.	*Ploughs.*				*Pumps.*			*Sugar pans.*			*Grain kibbling mills.*			*Chaff cutters.*			*Dredgers.*		
	Sold.	Given for trial.	Sent with apprentices.	Total.	Sold.	Given for trial.	Total.	Sold.	Given for trial.	Total.	Sold.	Given for trial.	Total.	Sold.	Given for trial.	Total.	Sold.	Given for trial.	Total.
From 16th August, 1885 to 15th August, 1886.	167	35	149	351	37	14	51	7	1	8	12	...	12	9	...	9	4	1	5
From 16th August, 1886 to 15th August, 1887.	151	5	36	192	33	7	40	3	1	4	23	...	23	15	1	16	2	...	2

The great decrease in the number of ploughs is owing to extra ploughs not having been sent out to the districts within this year (1887). During the last two years in ploughing seasons, Moharirs were sent with ploughs to sell them on credit. The experience of the last two years has shown that great inconvenience and some loss results from selling ploughs on the terms of payment by instalment.

The number of ploughs actually sold has also decreased by 16.

Pump or water-lift.—There is a slight decrease in the sale of this implement also. Seven were not much taken this year.

The sale of grain kibbling and chaff-cutting machines is nearly doubled. Bull's dredgers and sugar evaporators do not yet find increasing sale.

Seed.—The following statement shows distribution :—

Month and date.	Muzaffarnagar wheat.	Oats.	Barley.	Sorgho.	Nankin cotton seed.	Guinea grass seed.	Linseed.	Tobacco.	Remarks.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
From 16th August, 1885 to 15th August, 1886.	62,630	1,205	247	517	712	39	94	2	
From 16th August, 1886 to 15th August, 1887.	37,190	3,854	...	330	1,218	12¼	...	1½	

Many zamíndárs, who took seed in previous years, have now a sufficient store of their own; this accounts for smaller sales during the year.

MIR MUHAMMAD HUSAIN, M.R.A.C., C.,

Assistant Director, in charge of Farm.

STATEMENT No. 1.—STANDARD SERIES.

		Calculation of the result and comparison of outturn with the standard plot in the series.								*Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.*								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
Number of plots as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	*Actual outturn per acre.*		*Value of outturn.*			Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks.
										Grain.	Straw.	Grain at Re. 1 per 41lbs.	Straw at Re. 1 per 400lbs.	Total.				
	Quantity of manure applied per acre.	lbs	lbs.	lbs.	lbs.	lbs	lbs.	lbs.	lbs	lbs.	lbs.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	
1	Saltpetre, 240lbs. per acre, at Rs. 3-8-0 per 82lbs ...	319	102	217	66	47	213	16	193	1,234	2,626	30 2	6 9	36 11	—7 5	—1 5	—8 10	
2	Ditto ditto and bonedust, 360lbs. per acre, at 11 annas per maund.	315	111	204	66	54	174	25	302	1,343	2,468	32 12	6 3	38 15	—10 10	+0 15	—9 11	
3	Cowdung, 180 maunds per acre, at Rs. 3 per 100 maunds ...	289	104	185	66	56	178	18	217	1,258	2,238	30 11	5 10	36 5	—2 6	—1 11	—4 1	
4	Ditto ditto and bonedust, 360lbs. at 11 annas per 82lbs	258	102	156	66	65	153	16	193	1,234	1,888	30 2	4 12	34 14	—5 11	—3 2	—8 13	
5	Cowdung, 180 maunds per acre, at Rs 3 per 100 maunds, and gypsum 240lbs per acre, at Rs. 1-14-0 per 82lbs.	295	96	199	65	48	207	10	121	1,162	2,408	28 5	6 0	34 5	—7 8	—3 11	—11 3	
6	Sheepdung, 180 maunds per acre at Rs. 3 per 100 maunds	266	102	164	66	62	161	16	193	1,234	1,984	30 2	4 15	35 1	—2 6	—2 15	—5 5	
7	Ashes of 180 maunds dung per acre, at Rs. 3 per 100 maunds.	172	69	103	64	67	149	17	206	835	1,246	20 6	3 2	23 8	—2 8	—14 8	—17 0	
8	Sheepdung, 180 maunds, at Rs. 3 per 100 maunds, and bonedust 360lbs per acre, at 11 annas per 82lbs.	227	90	137	65	66	152	4	48	1,089	1,658	26 9	4 2	30 11	—5 11	—7 5	—13 0	
9	Saltpetre, 240lbs per acre, at Rs 3-8-0 per 82lbs, and superphosphate 240lbs per acre, at Rs. 4 8-0 per 112lbs.	258	99	159	65	62	161	13	157	1,198	1,924	29 3	4 13	34 0	—17 0	—4 0	—21 0	
10	Sheepdung, 180 maunds, at Rs 3 per 100 maunds, and gypsum, 240lbs. per acre, at Re. 1 per 82lbs	386	108	278	66	39	257	22	266	1,307	3,364	31 14	8 7	40 5	—7 8	+2 5	—5 3	
11	No manure	251	86	165	65	52	192	+	+	1,041	1,996	25 6	5 0	30 6	+3 0	—7 10	—4 10	
12	Poudrette, 180 maunds per acre, at Rs. 4 per 100 maunds ..	356	120	236	66	51	197	34	411	1,452	2,856	35 7	7 2	42 9	—5 12	+4 9	—1 3	
13	Ashes of 180 maunds cowdung, at Rs. 3 per 100 maunds, and saltpetre 240lbs per acre, at Rs 3-8 0 per 82lbs.	307	96	211	65	45	220	10	121	1,162	2,553	28 5	6 6	34 11	—12 13	—3 5	—16 2	

STATEMENT No. II.—DUPLICATE SERIES.

Calculation of the result and comparison of outturn with the standard plot in the series.										*Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.*								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
Number of plots as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	*Actual outturn per acre.*		*Value of outturn.*			Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38	Net profit or loss over or against the assumed income, Rs 38.	Remarks.
										Grain.	Straw.	Grain at Re. 1 per 41lbs.	Straw at Re. 1 per 400lbs.	Total.				
	Quantity of manure applied per acre.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	Rs. a.	Rs. a.	Rs. a.	Rs. a	Rs. a.	Rs. a.	
1	Saltpetre, 240lbs. per acre at Rs. 3-8-0 per 82lbs.	347	118	229	66	52	194	14	170	1,428	2.771	34 13	6 15	41 12	—7 5	+3 12	—3 9	
2	Ditto ditto and bonedust 360lbs. per acre at annas 11 per 82lbs.	348	129	219	66	59	170	25	303	1,561	2,650	38 1	6 10	44 11	—10 10	+6 11	—3 15	
3	Cowdung, 180 maunds per acre at Rs 3 per 100 maunds ...	309	105	204	66	51	194	1	12	1 270	2,468	31 0	6 3	37 3	—2 6	—0 13	—3 3	
4	Ditto ditto and bonedust 360lbs. per acre at 11 annas per 82lbs.	334	145	189	66	77	130	41	496	1,754	2,287	42 12	5 11	48 7	—5 11	+10 7	+4 12	
5	Ditto ditto and gypsum 240lbs. per acre at Rs. 1-12-0 per 82lbs	334	123	211	66	58	172	19	230	1,488	2,553	36 5	6 6	42 11	—7 8	+4 4	—2 13	
6	Ashes of cowdung, 180 maunds at Rs. 3 per 100 maunds ...	197	69	130	65	53	188	—35	423	835	1 573	20 6	3 15	24 5	—2 8	—13 11	—16 3	
7	Sheepdung, 180 maunds per acre at Re. 1 per 100 maunds and bonedust 360 lbs per acre at 11 annas per 82lbs.	296	106	190	66	56	179	2	25	1 283	2.299	31 5	5 12	37 1	—5 11	—0 15	—6 10	
8	Saltpetre, 240lbs. per acre at Rs. 3-8-0 per 82lbs. and superphosphate 240lbs. per acre at Rs. 4-8 0 per 112lbs.	414	122	292	66	42	239	18	218	1,476	3,533	36 0	8 13	44 13	—17 0	+6 13	—10 3	
9	Sheepdung, 180 maunds at Rs. 3 per 100 maunds and gypsum 240lbs. per acre at Re. 1-12-0 per 82lbs.	431	129	302	66	43	234	25	303	1,561	3,654	38 1	9 2	47 3	—7 8	+9 3	+1 11	
10	Unmanured	215	104	211	66	49	203	+	+	1,258	2,553	30 11	6 6	37 1	+3 0	—0 15	+2 1	
11	Sheepdung, 180 maunds per acre at Rs. 3 per 100 maunds ...	469	144	325	66	44	226	40	484	1.742	3,932	42 8	9 13	52 5	—2 6	+14 5	+11 15	
12	Poudrette ditto ditto ...	518	162	356	66	46	220	58	702	1,960	4,308	47 13	10 12	58 9	—5 12	+20 9	+14 13	
13	Ashes of 180 maunds cowdung at Rs. 3 per 100 maunds and saltpetre 240lbs. per acre at Rs 3-8-0 per 82lbs.	522	165	357	66	46	216	61	738	1,996	4,320	48 11	10 13	59 8	—12 13	+21 8	+8 11	

STATEMENT No. III.—GREEN MANURE SERIES.

		Calculation of the result and comparison of outturn with the standard plot in the series.								*Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.*								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
										Actual outturn per acre.		*Value of outturn.*						
Number of plots as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	Grain.	Straw.	Grain at Re. 1 per 41 lbs.	Straw at Re. 1 per 400 lbs.	Total.	Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks.
	Quantity of manure applied per acre.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	
1	Old indigo refuse, 120 maunds at 1 Re. per 100 maunds per acre,	297	108	189	65	57	175	+38	+460	1,307	2,287	31 14	5 11	37 9	— 1 12	— 0 7	— 2 3	
2	Fresh ditto ditto ditto ...	328	120	208	66	58	173	+50	+605	1,452	2,517	35 7	6 5	41 12	— 3 8	+ 3 12	+ 0 4	
3	Indigo water, 3,600 cubic feet per acre at Re. 1 per 1,200 cubic feet.	221	61	160	63	38	262	— 9	—109	738	1,936	18 0	4 13	22 13	—34 0	—15 3	—49 3	
4	Hemp water, 3,600 cubic feet per acre at Re. 1 per 1,200 cubic feet.	192	64	128	64	50	200	— 6	— 73	774	1,549	18 14	3 14	22 12	—15 8	—15 4	—30 12	
5	No manure	227	70	157	64	45	227	+	+	847	1,900	20 10	4 12	25 6	+ 3 0	—12 10	— 9 10	
6	After hemp crop	160	53	107	63	50	202	—17	—206	641	1,295	15 10	3 4	18 14	+23 0	—19 2	+ 3 14	
7	Green manured with hemp at Rs. 3-8-0 per acre	197	72	125	64	58	174	+ 2	+ 24	871	1,512	21 4	3 12	25 0	— 0 4	—13 0	—13 4	
8	Green manured with indigo at Rs. 8 per acre	350	105	245	65	43	233	+35	+423	1,270	2,964	31 0	7 7	38 7	+ 0 1	+ 0 7	+ 0 8	
9	After indigo crop...	296	106	190	65	56	179	+36	+436	1,283	2,299	31 5	5 12	37 1	+23 0	— 0 15	+22 1	
10	Green indigo ploughed as manure at Re. 1-12-0 per 82lbs. per acre with 6 maunds gypsum.	397	132	265	66	50	201	+62	750	1,597	3,206	38 15	8 0	46 15	—10 7	+ 8 15	— 1 8	
11	Green hemp ploughed as manure at Re. 1-12-0 per 82lbs. per acre with 6 maunds gypsum.	299	109	190	65	94	174	39	472	1,319	2,299	32 3	5 12	37 15	—10 12	— 0 1	—10 13	
12	No manure	266	97	169	65	57	179	+	+	1,174	2,045	28 10	5 2	33 12	+ 3 0	— 4 4	— 1 4	
13	Alternate with lucerne	241	3	238	+	1	7,933	...	...	36	2,880	0 14	7 3	8 1	+ 3 0	—29 15	—26 15	

* Saving of the price of manure ... Rs. 3
Value of the crop of indigo sold ... „ 20

STATEMENT No. IV.—MISCELLANEOUS SERIES.

		Calculation of the result and comparison of outturn with the standard plot in the series.								*Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.*								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
										Actual outturn per acre.		*Value of outturn.*						
Number of plots as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	Grain.	Straw.	Grain at Re. 1 per 41lbs.	Straw at Re. 1 per 400lbs.	Total.	Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks.
	Quantity of manure applied per acre.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	Rs. a.	Rs. a.	Re. a.	Rs. a.	Rs. a.	Rs. a.	
1	Brick-kiln refuse, 120 maunds at Re. 1 per 100 maunds per acre.	186	66	120	64	55	182	29	351	799	1,452	19 8	3 10	23 2	+1 4	—14 14	—13 10	
2	Silt, 300 maunds at annas 8 per 100 maunds per acre ...	143	63	80	63	79	127	26	314	762	968	18 9	2 7	21 0	+2 4	—17 0	—14 12	
3	Compost, 200 maunds at Rs. 3 per 100 maunds per acre ...	160	64	96	64	67	150	27	326	774	1,162	18 14	2 14	21 12	—3 0	—16 4	—19 4	
4	Road scrapings, 300 maunds at Re. 1 per 100 maunds per acre.	242	86	156	64	55	181	49	593	1,041	1,888	25 6	4 4	30 1	—1 11	—7 15	—9 10	
5	Ashes of 120 maunds weeds at Rs. 3 per 100 maunds per acre,	106	32	74	+	43	231	—5	—61	387	895	9 7	2 4	11 11	—1 0	—26 5	—27 5	
6	Ashes, saltpetre, 240lbs. at Rs. 3-8-0 per 82lbs. per acre ...	181	52	129	+	40	248	15	181	629	1,561	15 6	3 14	19 4	—11 3	—18 12	—29 15	
7	Ammonic chloride, 240lbs. at Rs. 15 per 82lbs. per acre ...	180	61	119	+	51	195	24	290	738	1,440	18 0	3 10	21 10	—41 0	—16 6	—57 6	
8	No manure	121	37	84	+	44	227	+	+	418	1,016	10 15	2 9	13 8	+3 0	—24 8	—21 8	

STATEMENT No. V.—WATERING SERIES.

		Calculation of the result and comparison of outturn with the standard plot in the series.									Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.								
1		2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
Number of plots as per map of farm.		Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	Actual outturn per acre.		Value of outturn.			Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks.
											Grain.	Straw.	Grain at Re. 1 per 41lbs	Straw at Re. 1 per 400lbs.	Total.				
B.B		*Watering.*	lbs.	lbs.	lbs	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	Rs. a.	Rs a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	
1		Watered five times at Re. 1-4-0 per each watering from canal ...	305	113	192	65	59	170	51	617	1,367	2 323	33 5	5 13	39 2	—3 1	+1 2	—1 11	
2		Ditto four times at Re. 1-4-0 per each watering ditto ...	287	103	184	65	56	179	46	496	1,246	2,226	30 8	5 9	36 2	—1 13	—1 14	—3 11	
3		Ditto three times at Re. 1 4 0 per each watering ditto ...	242	88	154	64	57	175	26	315	1,065	1,863	26 0	4 11	30 11	—0 9	—7 5	—7 14	
4		Ditto twice at Re. 1-4-0 ditto ditto ...	219	80	139	64	58	174	18	218	968	1,682	23 10	4 3	27 13	+0 10	—10 3	—9 9	
5		Ditto once at Re 1-4-0 ditto ditto ...	172	63	109	64	58	173	1	12	762	1,319	18 9	3 5	21 14	+1 14	—16 2	—14 4	
6		Dry	174	62	112	63	55	181	+	+	750	1,355	18 5	3 6	21 11	+4 10	—16 5	—11 11	

STATEMENT No. VI.—WATERING SERIES.

B.A																			
1		Three times watered from well at Re. 1 15-6 per each time ...	274	86	188	65	46	219	29	351	1,041	2,275	25 6	5 11	31 1	+2 4	—6 15	—4 11	
2		Ditto from canal at Re. 1-4-0 per each watering,	190	57	133	64	43	233	+	+	690	1,609	16 14	4 0	20 14	+3 3	—17 2	—14 0	

STATEMENT No. VII.—GREEN MANURED DUPLICATE PLOTS RESULTS.

		Calculation of the result and comparison of outturn with the standard plot in the series.									*Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.*								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
Number of plots as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	*Actual outturn per acre.* Grain.	Straw.	*Value of outturn.* Grain at Re. 1 per 41lbs.	Straw at Re. 1 per 400lbs.	Total.	Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks.
a.	*Quantity of manure applied per acre.*	lbs.	lbs	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a	Rs. a.	
1	Green manured with hemp at Rs. 3-8 per acre ...	343	117	226	65	52	194	53	703	1,417	2,732	34 9	6 13	41 6	— 4	+ 4 5	+ 4 0	
2	No manure	199	59	140	+	42	237	+	+	714	1,694	17 7	4 4	21 11	+3 0	—16 5	—13 5	
b.																		
1	Green manured with hemp at Rs. 3-8-0 per acre ...	1,908	653	1,250	66	53	190	182	360	1,300	2,469	31 11	6 3	37 14	—4 0	—0 2	—4 2	
2	No manure	1,326	476	830	65	55	181	+	+	940	1,699	22 15	4 4	27 3	+3 0	—10 13	—7 13	
c																		
1	Green manured with hemp at Rs 3 8 0 per acre ...	2,347	857	1,490	65	58	174	+	1,183	1,782	3,098	34 7	7 12	51 3	—0 4	+13 3	+12 15	
2	No manure	604	182	422	65	43	232	+	+	599	1,389	14 10	3 8	18 2	+3 0	—19 14	—16 14	

STATEMENT No VIII.—GREEN MANURED DUPLICATE PLOTS RESULTS.

		Calculation of the result and comparison of outturn with the standard plot in the series.								Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
Number of plots as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	Actual outturn per acre.		Value of outturn.			Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks.
										Grain.	Straw.	Grain at Re. 1 per 41lbs.	Straw at Re. 1 per 400lbs.	Total.				
	Quantity of manure applied per acre.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	
1	Fresh indigo refuse, 120 mds. and lime 6 mds. per acre at Re. 1 per 100 mds. and Rs. 20 per 100 maunds.	660	196	464	65	42	237	86	521	1,186	2,807	28 15	7 0	35 15	—3 8	—2 1	—5 9	
2	Fresh indigo refuse, 120 mds. at Re. 1 per 100 mds. ...	463	180	283	65	64	157	70	424	1,089	1,712	26 9	4 4	30 13	—1 12	—7 3	—8 15	
3	Old indigo refuse, 120 mds. and lime 6 mds. per acre at Re. 1 per 100 mds. and Rs. 20 per 100 mds.	442	148	294	65	50	199	38	230	895	1,779	21 14	4 7	26 5	—3 8	—11 11	—15 3	
4	Old indigo refuse, 120 mds. at Re. 1 per 100 mds. ...	442	166	276	65	60	166	56	339	1,004	1,670	24 8	4 3	28 11	—1 12	—9 5	—11 1	
5	No manure	369	110	259	65	42	235	+	+	665	1,567	16 4	3 15	20 3	+3 0	—17 13	—14 13	

STATEMENT No. IX.—PLOUGHING SERIES.

		Calculation of the result and comparison of outturn with the standard plot in the series.								*Comparison of cost and income with the ordinary kind of cultivaton in vogue in this country.*								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
Number of plots as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	*Actual outturn per acre.*		*Value of outturn.*			Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks.
										Grain.	Straw.	Grain at Re. 1 per 41lbs.	Straw at Re. 1 per 400lbs.	Total.				
	Ploughing.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	Rs. a.	Rs. a	Rs. a.	Rs. a.	Rs. a.	Rs. a.	
1	Ploughed 5″ deep (four times), at annas 12 per each ploughing.	72	29	43	+	67	148	4	73	468	694	11 7	1 12	13 3	+5 12	—24 13	—19 1	
2	Ploughed (eight times) with country plough at 12 annas per each ploughing.	61	25	36	+	69	144	+	+	403	581	9 14	1 7	11 5	+3 4	—26 11	—23 7	
3	Ploughed (eight times) with country plough at 12 annas per each ploughing.	61	24	37	+	65	154	+	+	381	597	9 7	1 8	10 15	+3 4	—27 12	—23 13	
4	Ploughed 9″ deep (four times) at 12 annas per each ploughing.	90	37	53	+	70	143	12	202	597	855	14 9	2 2	16 11	+3 4	—21 5	—18 1	
5	Ploughed 9″ deep (four times) at 12 annas per each ploughing.	800	285	515	64	55	181	220	434	563	1,017	13 12	2 9	16 5	+3 4	—21 11	—18 7	
6	Ploughed 5″ deep (four times) at 12 annas per each ploughing.	410	124	286	63	43	231	59	116	245	565	6 0	1 7	7 7	+5 12	—30 9	—24 13	
7	Ploughed (eight times) with country plough at 12 annas per each ploughing.	265	65	200	63	32	305	×	×	128	395	3 2	1 0	4 2	+3 4	—33 14	—30 10	

STATEMENT No. X.

		Calculation of the result and comparison of outturn with the standard plot in the series.								Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
Number of plots as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	Actual outturn per acre.		Value of outturn.			Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks
										Grain.	Straw.	Grain at Re. 1 per 41lbs.	Straw at Re. 1 per 400lbs.	Total.				
	Quantity of manure applied per acre.	lbs.	lbs.	lbs.	lbs	lbs.	lbs.	lbs.	lbs	lbs.	lbs.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	
1	Mustard cake, 5 maunds at Re. 1 per acre, 30 seers per acre ...	464	153	311	64	49	203	24	190	1,209	2,458	29 8	6 2	35 10	— 5 1	— 2 6	— 7 7	
2	Ditto 10 maunds ditto ditto ..	471	165	306	65	54	185	36	285	1,304	2,418	31 13	6 1	37 14	—13 1	— 0 2	—13 3	
3	Cowdung, 200 maunds at Rs. 3 per 100 maunds per acre ...	506	186	320	65	58	172	57	451	1,470	2,529	35 14	6 6	42 4	— 3 0	+ 4 4	+ 1 4	
4	Mustard cake-fed dung, 50 maunds per acre at Rs. 4 per 100 maunds.	448	176	272	65	65	154	47	372	1,391	2,149	33 15	5 6	39 5	+ 1 0	+ 1 5	+ 2 5	
5	Ditto ditto 100 maunds ditto ditto ...	464	188	276	67	68	147	59	467	1,486	2,181	36 4	5 7	41 11	— 1 0	+ 3 4	+ 1 4	
6	Cowdung, 200 maunds at Rs. 3 per 100 maunds per acre ...	506	178	328	65	54	184	49	388	1,407	2,592	34 5	6 8	40 13	— 3 0	+ 2 13	— 0 3	
7	No manure	391	129	262	66	49	203	+	+	1,019	2,070	24 14	5 3	30 1	+ 3 0	— 8 0	— 5 0	

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STATEMENT No. XI.

		Calculation of the result and comparison of outturn with the standard plot in the series.								Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
Number of plots as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plot in the series.	Increase or decrease per acre.	Actual outturn per acre.		Value of outturn.			Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 30.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks.
										Grain.	Straw.	Grain at Re. 1 per 41lbs.	Straw at Re 1 per 400lbs.	Total.				
	Quantity of manure applied per acre.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	
1	Cotton seed-fed dung, 50 maunds per acre at Rs. 4 per 100 maunds.	346	133	213	65	62	160	19	150	1,051	1,683	25 10	4 3	29 13	+1 0	—8 3	—7 3	
2	Cotton seed-fed dung, 100 maunds per acre at Rs 4 per 100 maunds.	348	129	219	65	59	170	15	118	1,019	1 731	24 14	4 5	29 3	—1 0	—8 13	—9 13	
3	Cowdung, 200 maunds at Rs 3 per 100 maunds per acre .	315	110	205	64	54	186	—4	—32	269	1,620	21 3	4 1	25 4	—3 0	—12 12	—15 12	
4	Perished cotton seed, 5 maunds at Re. 1 per 29 seers per acre.	326	103	223	67	46	216	—11	—87	814	1,762	19 14	4 6	24 4	—3 15	—13 12	—17 11	
5	Perished cotton seed, 10 maunds at Re. 1 per 29 seers per acre.	367	150	217	66	69	155	36	284	1,185	1,715	28 14	4 5	33 3	—13 1	—4 13	—17 15	
6	Cowdung, 200 maunds at Rs 3 per 100 maunds per ac ..	297	98	199	65	49	203	—16	—127	774	1,573	18 14	3 15	22 13	—3 0	—15 3	—18 3	
7	No manure	295	114	181	65	63	159	+	+	901	1,430	22 0	3 9	25 9	+3 0	—12 7	—9 7	

STATEMENT No. XII.

Calculation of the result and comparison of outturn with the standard plot in the series.										*Comparison of cost and income with the ordinary kind of cultivation in vogue in this country.*								
1	2	3	4	5	6	7	8	9	10	11		12			13	14	15	16
Number of plot as per map of Farm.	Detail of special treatment with the rate of its cost.	Weight of unthreshed sheaves.	Weight of grain.	Weight of straw.	Weight of grain per bushel.	Percentage of grain on straw.	Percentage of straw on grain.	Increase or decrease over standard plots in the series.	Increase or decrease per acre.	*Actual outturn per acre.*		*Value of outturn.*			Gain or loss per acre in the cost against the cost of ordinary cultivation assumed to be Rs. 80.	Gain or loss per acre in the value of outturn against ordinary cultivation assumed to be Rs. 38.	Net profit or loss over or against the assumed income, Rs. 38.	Remarks.
										Grain.	Straw.	Grain at Re. 1 per 41lbs.	Straw at Re. 1 per 400lbs.	Total.				
	Quantity of manure applied per acre.	lbs.	lbs.	lbs.	lbs	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. a	Rs. a.	
						Mundia wheat.												
38	No manure	2,591	826	1,765	66	47	214	...	617	1,209	2,583	29 8	6 7	35 15	+3 0	—2 1	+0 15	
						Muzaffarnagar wheat.												
	No manure	346	107	239	65	45	223	...	...	592	1,322	14 7	3 4	17 11	+3 0	—10 5	—7 5	